BioMap and Living Waters

Guiding Land Conservation for Biodiversity in Massachusetts

Core Habitats of Royalston

This report and associated map provide information about important sites for biodiversity conservation in your area.

This information is intended for conservation planning, and is not intended for use in state regulations.

Produced by:

Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

Produced in 2004

BioMap and Living Waters:
Guiding Land Conservation for Biodiversity in Massachusetts

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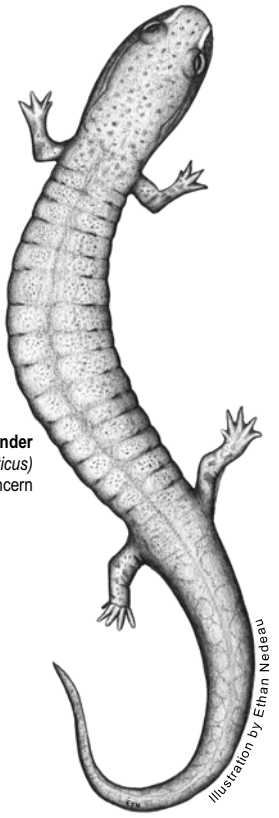
* Depending on the location of Core Habitats, your city or town may not have all of these sections.



Spring Salamander
(Gyrinophilus porphyriticus)
Species of Special Concern

Funding for this project was made available by the Executive Office of Environmental Affairs, contributions to the Natural Heritage & Endangered Species Fund, and through the State Wildlife Grants Program of the US Fish & Wildlife Service.

Natural Heritage & Endangered Species Program

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For more information on rare species and natural communities, please see our fact sheets online at ***www.nhesp.org***

BioMap and Living Waters:
Guiding Land Conservation for Biodiversity in Massachusetts

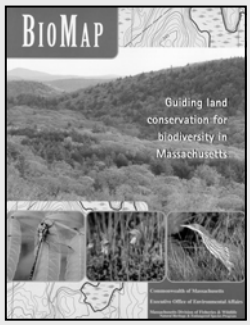
Introduction

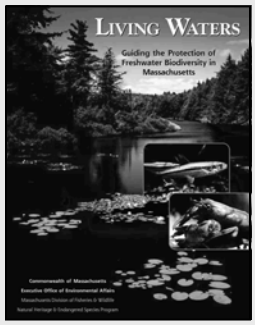
In this report, the Natural Heritage & Endangered Species Program provides you with site-specific biodiversity information for your area. Protecting our biodiversity today will help ensure the full variety of species and natural communities that comprise our native flora and fauna will persist for generatons to come.

The information in this report is the result of two statewide biodiversity conservation planning projects, ***BioMap*** and ***Living Waters***. The goal of the BioMap project, completed in 2001, was to identify and delineate the most important areas for the long-term viability of terrestrial, wetland, and estuarine elements of biodiversity in Massachusetts. The goal of the Living Waters project, completed in 2003, was to identify and delineate the rivers, streams, lakes, and ponds that are important for freshwater biodiversity in the Commonwealth. These two conservation plans are based on documented observations of rare species, natural communities, and exemplary habitats.

What is a Core Habitat?

Both BioMap and Living Waters delineate ***Core Habitats*** that identify the most critical sites for biodiversity conservation across the state. Core Habitats represent habitat for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. Core Habitats represent a wide diversity of rare species and natural communities (see Table 1), and these areas are also thought to contain virtually all of the other described species in Massachusetts. Statewide, BioMap Core Habitats encompass 1,380,000 acres of uplands and wetlands, and Living Waters identifies 429 Core Habitats in rivers, streams, lakes, and ponds.





Get your copy of the ***BioMap*** and ***Living Waters*** reports! Contact Natural Heritage at 508-792-7270, Ext. 200 or email natural.heritage@state.ma.us. Posters and detailed technical reports are also available.

Core Habitats and Land Conservation

One of the most effective ways to protect biodiversity for future generations is to protect Core Habitats from adverse human impacts through land conservation. For Living Waters Core Habitats, protection efforts should focus on the ***riparian areas***, the areas of land adjacent to water bodies. A naturally vegetated buffer that extends 330 feet (100 meters) from the water's edge helps to maintain cooler water temperature and to maintain the nutrients, energy, and natural flow of water needed by freshwater species.

In Support of Core Habitats

To further ensure the protection of Core Habitats and Massachusetts' biodiversity in the long-term, the BioMap and Living Waters projects identify two additional areas that help support Core Habitats.

In BioMap, areas shown as ***Supporting Natural Landscape*** provide buffers around the Core Habitats, connectivity between Core Habitats, sufficient space for ecosystems to function, and contiguous undeveloped habitat for common species. Supporting Natural Landscape was

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generated using a Geographic Information Systems (GIS) model, and its exact boundaries are less important than the general areas that it identifies. Supporting Natural Landscape represents potential land protection priorities once Core Habitat protection has been addressed.

In Living Waters, ***Critical Supporting Watersheds*** highlight the immediate portion of the watershed that sustains, or possibly degrades, each freshwater Core Habitat. These areas were also identified using a GIS model. Critical Supporting Watersheds represent developed and undeveloped lands, and can be quite large. Critical Supporting Watersheds can be helpful in land-use planning, and while they are not shown on these maps, they can be viewed in the Living Waters report or downloaded from www.mass.gov/mgis.

Understanding Core Habitat Species, Community, and Habitat Lists

What's in the List?

Included in this report is a list of the species, natural communities, and/or aquatic habitats for each Core Habitat in your city or town. The lists are organized by Core Habitat number.

For the larger Core Habitats that span more than one town, the species and community lists refer to the entire Core Habitat, not just the portion that falls within your city or town. For a list of all the state-listed rare species within your city or town's boundary, whether or not they are in Core Habitat, please see the town rare species lists available at www.nhesp.org.

The list of species and communities within a Core Habitat contains only the species and natural communities that were explicitly included in a given BioMap or Living Waters Core Habitat. Other rare species or examples of other natural communities may fall within the Core Habitat, but for various reasons are not included in the list. For instance, there are a few rare species that are omitted from the list or summary because of their particular sensitivity to the threat of collection. Likewise, the content of many very small Core Habitats are not described in this report or list, often because they contain a single location of a rare plant

Table 1. The number of rare species and types of natural communities explicitly included in the BioMap and Living Waters conservation plans, relative to the total number of native species statewide.

BioMap

	Species and Verified Natural Community Types	
Biodiversity Group	**Included in BioMap**	**Total Statewide**
Vascular Plants	246	1,538
Birds	21	221 breeding species
Reptiles	11	25
Amphibians	6	21
Mammals	4	85
Moths and Butterflies	52	An estimated 2,500 to 3,000
Damselflies and Dragonflies	25	An estimated 165
Beetles	10	An estimated 2,500 to 4,000
Natural Communities	92	> 105 community types

Living Waters

	Species	
Biodiversity Group	**Included in Living Waters**	**Total Statewide**
Aquatic Vascular Plants	23	114
Fishes	11	57
Mussels	7	12
Aquatic Invertebrates	23	An estimated > 2500

species. Some Core Habitats were created for suites of common species, such as forest birds, which are particularly threatened by habitat fragmentation. In these cases, the individual common species are not listed.

What does 'Status' mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act, M.G.L. c.131A, and its implementing regulations, 321 CMR 10.00. Rare species are categorized as Endangered, Threatened, or of Special Concern according to the following:

- ***Endangered*** species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.
- ***Threatened*** species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- ***Special Concern*** species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition, the Natural Heritage & Endangered Species Program maintains an unofficial ***watch list*** of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated any laws or regulations, but they can help to identify ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

- ***Critically Imperiled*** communities typically have 5 or fewer documented sites or have very few remaining acres in the state.
- ***Imperiled*** communities typically have 6-20 sites or few remaining acres in the state.
- ***Vulnerable*** communities typically have 21-100 sites or limited acreage across the state.
- ***Secure*** communities typically have over 100 sites or abundant acreage across the state; however excellent examples are identified as Core Habitat to ensure continued protection.

Legal Protection of Biodiversity

BioMap and Living Waters present a powerful vision of what Massachusetts would look like with full protection of the land that supports most of our biodiversity. To create this vision, some populations of state-listed rare species were deemed more likely to survive over the long-term than others.

Regardless of their potential viability, all sites of state-listed species have full legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.37 and 10.59). The ***Massachusetts Natural Heritage Atlas*** shows **Priority Habitats**, which are used for regulation under the Massachusetts Endangered Species Act and Massachusetts Environmental Policy Act (M.G.L. c.30) and **Estimated Habitats**, which are used for regulation of rare wildlife habitat under the Wetlands Protection Act. For more information on rare species regulations, see the *Massachusetts Natural Heritage Atlas*, available from the Natural Heritage & Endangered Species Program in book and CD formats.

BioMap and Living Waters are conservation planning tools and do not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the combined BioMap and Living Waters vision is fully realized, we must continue to protect all populations of our state-listed species and their habitats through environmental regulation.

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Understanding Core Habitat Summaries

Following the BioMap and Living Waters Core Habitat species and community lists, there is a descriptive summary of each Core Habitat that occurs in your city or town. This summary highlights some of the outstanding characteristics of each Core Habitat, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific ***fact sheets*** at www.nhesp.org.

Next Steps

BioMap and Living Waters were created in part to help cities and towns prioritize their land protection efforts. While there are many reasons to conserve land – drinking water protection, recreation, agriculture, aesthetics, and others – BioMap and Living Waters Core Habitats are especially helpful to municipalities seeking to protect the rare species, natural communities, and overall biodiversity within their boundaries. Please use this report and map along with the rare species and community fact sheets to appreciate and understand the biological treasures in your city or town.

Protecting Larger Core Habitats

Core Habitats vary considerably in size. For example, the average BioMap Core Habitat is 800 acres, but Core Habitats can range from less than 10 acres to greater than 100,000 acres. These larger areas reflect the amount of land needed by some animal species for breeding, feeding, nesting, overwintering, and long-term survival. Protecting areas of this size can be very challenging, and requires developing partnerships with neighboring towns.

Prioritizing the protection of certain areas within larger Core Habitats can be accomplished through further consultation with Natural Heritage Program biologists, and through additional field research to identify the most important areas of the Core Habitat.

Additional Information

If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program:

by Phone *508-792-7270, Ext. 200*

by Fax: *508-792-7821*

by Email: *natural.heritage@state.ma.us*.

by Mail: *North Drive*
Westborough, MA 01581

The GIS datalayers of BioMap and Living Waters Core Habitats are available for download from MassGIS: www.mass.gov/mgis

Check out www.nhesp.org for information on:

- Rare species in your town
- Rare species fact sheets
- BioMap and Living Waters projects
- Natural Heritage publications, including:
  - Field guides
  - Natural Heritage Atlas, and more!

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BioMap: Species and Natural Communities

Royalston

Core Habitat BM94

Natural Communities

Common Name	Scientific Name	Status
Acidic Shrub Fen		Vulnerable
Forest Seep Community		Secure
Inland Acidic Pondshore/Lakeshore		Secure
Level Bog		Vulnerable
Shrub Swamp		Secure

Vertebrates

Common Name	Scientific Name	Status
Spring Salamander	*Gyrinophilus porphyriticus*	Special Concern
Wood Turtle	*Clemmys insculpta*	Special Concern

Core Habitat BM95

Natural Communities

Common Name	Scientific Name	Status
Shrub Swamp		Secure

Plants

Common Name	Scientific Name	Status
Sand Violet	*Viola adunca*	Endangered

Vertebrates

Common Name	Scientific Name	Status
American Bittern	*Botaurus lentiginosus*	Endangered
Blue-spotted Salamander	*Ambystoma laterale*	Special Concern
Spotted Turtle	*Clemmys guttata*	Special Concern
Spring Salamander	*Gyrinophilus porphyriticus*	Special Concern
Wood Turtle	*Clemmys insculpta*	Special Concern

BioMap: Species and Natural Communities

Royalston

Core Habitat BM110

Natural Communities

Common Name	Scientific Name	Status
Acidic Rock Cliff Community		Secure
Circumneutral Talus Forest/Woodland		Vulnerable
Northern Hardwoods - Hemlock - White Pine Forest		Secure
White Pine - Oak Forest		Secure

Vertebrates

Common Name	Scientific Name	Status
Four-toed Salamander	*Hemidactylium scutatum*	Special Concern
Wood Turtle	*Clemmys insculpta*	Special Concern

Core Habitat BM212

Natural Communities

Common Name	Scientific Name	Status
Acidic Rock Cliff Community		Secure

Core Habitat BM376

Natural Communities

Common Name	Scientific Name	Status
Low-Energy Riverbank		Secure

Core Habitat BM377

Natural Communities

Common Name	Scientific Name	Status
Shallow Emergent Marsh		Secure

BioMap: Species and Natural Communities

Royalston

Vertebrates

Common Name	Scientific Name	Status
Wood Turtle	*Clemmys insculpta*	Special Concern

BioMap: Core Habitat Summaries

Royalston

Core Habitat BM94

This long Core Habitat encompasses the East Branch of the Tully River and two of its tributaries. Here the coldwater brooks provide significant habitat for Spring Salamanders. Also within the Core Habitat is a diversity of natural wetland communities, including the largest Acidic Shrub Fen identified in the state. Much of the area within the Core Habitat is protected as conservation land such as the Royalston State Forest.

Natural Communities

This Core Habitat contains a variety of high-quality, well-buffered wetland communities, including the largest Acidic Shrub Fen identified in the state, as well as high-quality Level Bogs. Acidic Shrub Fens are shrub-dominated acidic peatlands found primarily along pond margins in the eastern and central part of the state. These wetland communities experience some groundwater and/or surface water inputs, but no calcareous seepage. Meanwhile, Level Bogs are dwarf shrub peatlands, generally with pronounced hummock and hollow formations. These wetland peatlands are our most acidic and nutrient-poor, because they receive little overland water input, and are not connected to the water table. Also included in this large wetland complex is a diverse Inland Acidic Pondshore community with no exotic upland plant species on over one mile of shoreline. Part of this Core Habitat is out of the area affected by the dam.

Vertebrates

This elongate Core Habitat encompasses riparian habitats and adjacent uplands along the East Branch of the Tully River and two of its tributaries. It includes meandering streams, wet meadows, forested wetlands, and cold, high-gradient brooks. It is these cold, high-gradient brooks and headwater seeps that provide significant and connected habitat for Spring Salamanders. Slower, meandering streams and adjacent wetlands and uplands within 600 yards may also support significant populations of Wood Turtles.

Core Habitat BM95

This large Core Habitat represents an excellent opportunity to protect extensive habitat for Wood Turtles and other rare animals. It encompasses the upper reaches of the Millers River and its headwaters that offer riverine habitats, riparian wetlands, and adjacent uplands. The Core Habitat also contains a good riverside Shrub Swamp community and habitat for the Endangered Sand Violet. Large areas of this Core Habitat are protected as conservation land within the Birch Hill Wildlife Management Area, Otter River Wildlife Management Area, and Templeton State Forest.

Natural Communities

This Core Habitat contains a moderate-sized riverside Shrub Swamp with several different species and habitats. Shrub Swamp communities are a common and variable type of wetland occurring on seasonally or temporarily flooded soils. They are often found in the transition zone between emergent marshes and swamp forests.

Plants

The Endangered Sand Violet, adapted to exposed soil conditions, is found in one part of this Core Habitat.

Vertebrates

This Core Habitat contains over 23 miles of relatively well-connected, meandering streams bordered by a variety of wetlands and uplands that may offer one of the best opportunities in the state to preserve a viable population of Wood Turtles. Shallower, higher-gradient brooks and cool, forested seeps provide significant habitat for Spring Salamanders. Blue-spotted Salamanders and Spotted Turtles have also been observed within this area.

Also within this Core Habitat, a shallow, sedge-dominated marsh along the upper reaches of Priest Brook provides habitat for American Bitterns. Additional field surveys may find bitterns and other marsh birds breeding at other locations within this Core Habitat, including in wet meadows and beaver-impounded wetlands.

Core Habitat BM110

This Core Habitat encompasses many miles of riparian habitats along the Tully River and its tributaries, and represents an excellent opportunity to conserve significant populations of Wood Turtles. There are also several different types of natural communities associated with Tully Mountain, as well as wet, forested areas that support Four-toed Salamanders.

Natural Communities

This Core Habitat contains the many natural communities of Tully Mountain. These include acidic cliffs and talus slopes surrounded by one of the largest and most mature (possibly old-growth) Northern Hardwoods-Hemlock-White Pine Forests in the state. Northern Hardwoods-Hemlock-White Pine Forests have a mix of evergreen and deciduous trees, with a closed, full canopy, and sparse shrub and herbaceous layers. They commonly occur on north facing slopes and ravines with moderately acidic soils.

Vertebrates

The long-term preservation of significant populations of Wood Turtles may be possible within this Core Habitat, along meandering streams, in riparian meadows and swamps, and in upland forests and fields within 600 yards of streams. Significant habitat for Four-toed Salamanders is also present, especially in wet, forested areas dominated by sphagnum moss. The American Bittern, a rare marsh bird, may use the wet meadows and shallow marsh habitats modified by beavers. There is good connectivity of stream-side habitats within this Core Habitat. Protection efforts should seek to maximize the width and connectivity of habitats adjacent to streams.

Core Habitat BM212

Natural Communities

This Core Habitat contains a small Acidic Rock Cliff with a good diversity of moisture, light, slope, and plant species. Acidic Rock Cliffs are open communities of extremely sparse plants, with occasional dense lichen, on ledges and in crevices of acidic cliff faces. Here the community is embedded within a large forested area, is free of exotic invasive species, and has few signs of disturbance by people.

BioMap: Core Habitat Summaries

Royalston

Core Habitat BM376

Natural Communities

This Core Habitat includes several high-quality stretches of Low-Energy Riverbank vegetation with excellent species diversity and a low percentage of invasive exotic species. Low-Energy Riverbanks are open herbaceous communities occurring on sandy or silty mineral soils of river and streambanks that do not experience severe flooding or ice scour. This high-quality area of the Millers River extends for 10 kilometers and is well-buffered by natural vegetation.

Core Habitat BM377

This Core Habitat, centered on Beaver Brook, contains a large and diverse Shallow Emergent Marsh community, as well as a long riparian corridor that provides habitat for rare species such as Wood Turtles.

Natural Communities

This Core Habitat contains a large, narrow Shallow Emergent Marsh with good habitat diversity, including shrub patches and open water in addition to the predominant meadow-like marsh. The Shallow Emergent Marsh community is a graminoid wetland found in broad, flat areas bordering rivers or along pond margins. It commonly occurs in abandoned beaver ponds, and differs from Deep Emergent Marsh in having less standing water.

Vertebrates

In this Core Habitat, meandering streams are bordered by a variety of riparian wetland and uplands, which likely provide habitat for Wood Turtles based on observations of this species in the area. Conservation efforts should seek to maintain roadless and undeveloped habitat along unbroken corridors at least 600 yards wide along both sides of streams and around wetlands within this Core Habitat.

Living Waters: Species and Habitats

Royalston

Core Habitat LW134

Exemplary Habitats

Common Name	Scientific Name	Status
Fish Habitat		----------

Core Habitat LW145

Exemplary Habitats

Common Name	Scientific Name	Status
Fish Habitat		----------

Core Habitat LW200

Invertebrates

Common Name	Scientific Name	Status
Triangle Floater	*Alasmidonta undulata*	Special Concern

Core Habitat LW201

Invertebrates

Common Name	Scientific Name	Status
Triangle Floater	*Alasmidonta undulata*	Special Concern

Core Habitat LW242

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Core Habitat LW418

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Living Waters: Core Habitat Summaries

Royalston

Core Habitat LW134

This section of Collar Brook is an excellent example of a high gradient, coldwater, well-oxygenated, and moderately flowing stream with rocky substrates. The fish community consists of Blacknose Dace, Brook Trout, and Slimy Sculpin. These species have narrow habitat requirements and as such are sensitive to even small changes in the surrounding landscape. Permanently protecting the riparian areas adjacent to this Core Habitat will help maintain the quality of the freshwater habitat.

Core Habitat LW145

This Core Habitat contains an example of a warmwater stream with diverse underwater habitats. The native fish community consists of Banded Sunfish, Creek Chubsucker, Chain Pickerel, and Pumpkinseed, which are species associated with aquatic vegetation in slow moving streams and rivers. The fish community also consists of Fallfish, Tessellated Darter, and White Sucker, which require clean gravel substrates and moderate flows for spawning (breeding). The mixture of species in this community suggests that Scott Brook contains a good variety of freshwater habitats worthy of protection.

Core Habitat LW200

The Millers River supports four of the state's twelve freshwater mussel species, including a vigorous population of the rare Triangle Floater that is distributed throughout the river. This mussel is found in deposits of sand and gravel that are out of the way of the swift current, such as those found along sandy shorelines, in backwaters, behind large boulders, in the pools below riffles, and in slower-flowing runs.

Core Habitat LW201

The Millers River supports four of the state's twelve freshwater mussel species, including a vigorous population of the rare Triangle Floater that is distributed throughout the river. This mussel is found in deposits of sand and gravel out of the way of the swift current, such as those found along sandy shorelines, in backwaters, behind large boulders, in pools below riffles, and in slower-flowing runs.

Core Habitat LW242

Lawrence Brook supports a healthy community of the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. The presence of this invertebrate community indicates the stream habitats here are relatively free of the impacts of development. Naturally vegetated stream banks and wetlands along the Core Habitat and upstream help maintain the habitat quality, shading the water to keep it cool and controlling the runoff of sediments, excess nutrients, and water.

Core Habitat LW418

Boyce Brook flows south from New Hampshire through wetlands and a mixed hardwood and

hemlock forest. The Core Habitat supports a healthy community of the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. The streambed is made up of a mix of boulders, cobbles, pebbles, gravels, and sands that provide excellent habitat for these invertebrates and the larger animals they support. Recent logging on the area has been away from the stream banks, leaving a vegetated buffer. Forested stream banks help maintain high-quality stream habitat by shading the water to keep it cool, by providing a natural energy source to the stream ecosystem in the form of leaves, needles, and sticks, and by controlling the runoff of sediments, excess nutrients, and water.

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To learn more about the Natural Heritage & Endangered Species Program and the Commonwealth's rare species, visit our web site at: www.nhesp.org.